

Using Horns on much lower Frequencies

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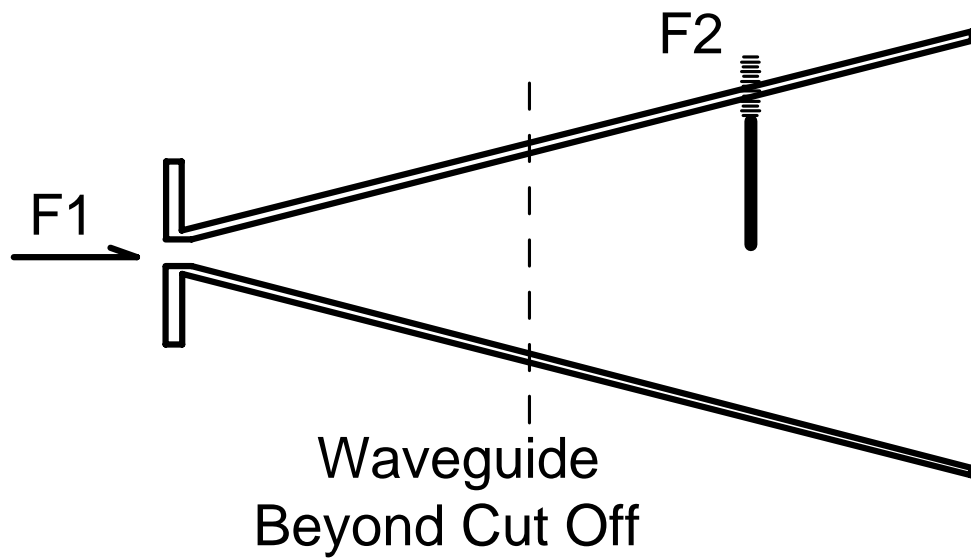
Recently I was doing some 700 MHz work on the antenna range and needed a good source antenna. So I used a 6 GHz horn. A 6 GHz horn on 700 MHz? Yea, well, it is a pretty big 6 GHz horn.



In the drawing you can see how only the end of the horn is used at the lower frequency. For the second frequency you plan to use the horn on, calculate the size of waveguide – beyond-cut off. That is, the size of the opening that will not pass a wave on that frequency. For 700 MHz that works out to when the throat of the horn just over 8 inches wide.

Now you can do the typical calculations for a Coax/Waveguide transition and mount the 2nd probe about 1/4 wavelength in front of the cutoff point. If you can measure SWR/Return Loss, then by all means tweak the length and position of the new problem. It is handy to use a threaded though connector that will let you remove the low frequency probe, just in case you need to do some serious work on the horn's original design frequency

Just a technique to let you use that big 10 gig horn on 5760 MHz or 3456 MHz.



Position of the new feed probe.



Added 700 MHz probe on an SMA connector.
This one liked a bit of C to ground for best return loss, thus the T shape